

**Question 1 (1 + 1 + 1 + 1 = 4 marks)**

For each of the following software requirements, say whether or not it is a well written requirement. Justify each of your answer in 1 - 2 sentences.

- a) It must be possible to store latitude and longitude information with each photo.
- b) The telephone system should provide high availability.
- c) Doctors are the only employees that can enter a patient's health information into the system.
- d) Comments written in the program should be informative.

**Question 2 (4 marks)**

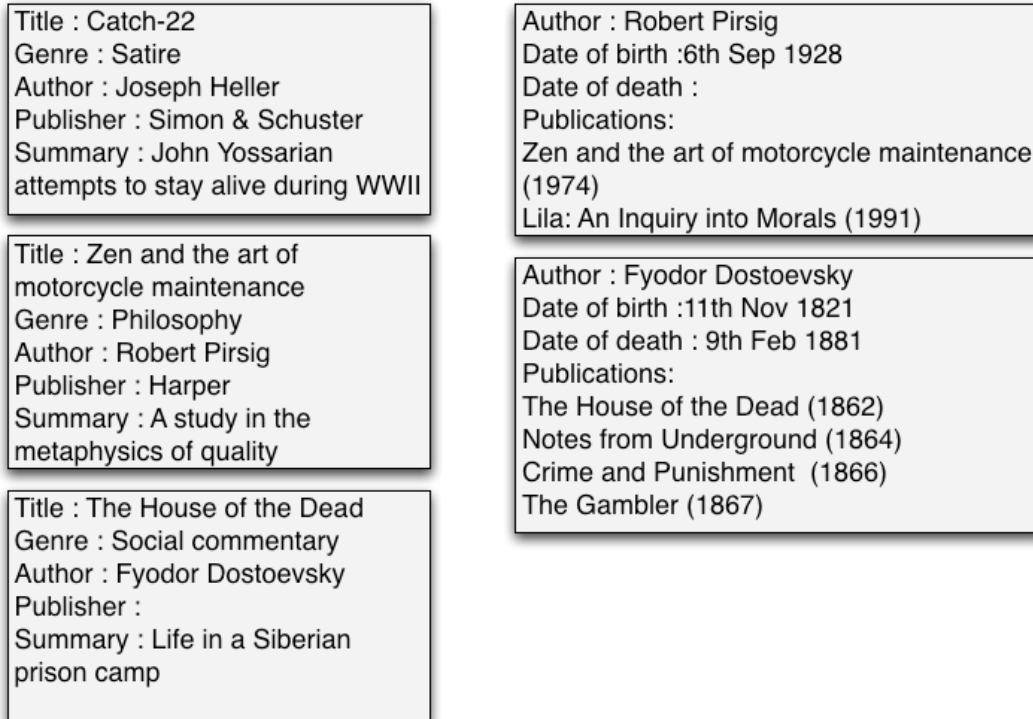
List two features that activity diagrams and class diagrams have in common.

**Question 3 (4 marks)**

Explain the difference between white and black box testing. Your answer should be 2-4 sentences long.

#### Question 4 (5 marks)

Consider the diagram below. Construct a class diagram suitable for representing this information.



#### Question 5 (5 + 5 + 3 = 13 marks)

Consider the information presented below

- Create a use case diagram for this problem.
- Create a class diagram that models this problem.
- Create a sequence diagram for the creation of the histogram.

Amazon allows people who log in to their website to post reviews on books. You can see all of the reviews for a given book, or you can view all the reviews made by a person.

When a review is given, the person also has to rate the book on a scale from 1 to 5. A histogram of the ratings, and the number of people who have given it each rating, is produced whenever the book review page is viewed.

#### Customer Reviews



#### Average Customer Review

★★★★☆ (23 customer reviews)

**Question 6 (10 marks)**

Create a state diagram for a seminar, based on the following description.

A seminar is initially proposed to be run by a university. If a room and time is available then the seminar is scheduled, and a booking website is set up. Once set up the seminar is advertised and bookings are taken.

When the seminar is fully booked the website indicates there are no more positions available. If someone cancels his or her booking the booking system is opened up again. Bookings are permanently closed off 1 week before the start of the event.

The seminar can be cancelled at any time before bookings are permanently closed off.

**Question 7 (5 marks)**

Draw a class diagram for the following problem.

Filming a movie is a complicated process that involves many people and considerable computer support.

As the filming takes place the recordings are loaded onto a computer by the cameraman. Each individual filming session (from start recording to end recording, a “shoot”) is date and time stamped. The location (a collection of GPS coordinates) is recorded so that the crew can return to the scene later if needed.

The shoots are edited by cutting them into “cuts” (each with a start and end time) and assembling the cuts into a single product. The system maintains information about the cut points (start and end times) so that they can easily be adjusted later.

**Question 8 (5 + 2 + 2 + 1 = 10 marks)**

Given the following information...

Task id	Task	Duration
1	Create unit test for class A	4
2	Create unit test for class B	2
3	Release software	0
4	System testing	4
5	Integration testing	5
6	Set up online selling system	11
7	Code class A	3
8	Code class B	6
9	Test online selling system	15
10	Determine business case for product	7

- Draw a Gantt chart showing the order tasks should occur in. You can assume you are not constrained by resources. You should label each task with its Task Id and name.
- Determine which tasks are on the critical path, and how long that path is.
- Draw an activity diagram for this workflow.
- If there was only one employee, which tasks would be on the critical path, and how long would it be?

**QUESTION 9 (5 marks)**

Discuss the concepts of **Risk Mitigation**, **Contingency Planning** and **Transition Monitoring** for the following problem. You should write 2-3 sentences for each concept.

A small company decides to write an iPhone application using the language Objective-C which they have not used before. They send their two staff on a training course, and buy appropriate laptops for them to develop on.

A version control system is installed to be used by the two programmers on a separate machine which has periodic backups made to hard disk. This machine fails and they find that the backups have not been successfully made resulting in a loss of 4 weeks of work.

This causes the project to be delivered late and in the mean time another company produces a similar application that is quickly becomes popular. When the first company's project is finally delivered it is mostly ignored because of the success of the rival product.

### QUESTION 10 (5 marks)

For the following description classify each activity and event with the corresponding Rational Unified Process' concepts of **phases** and **increments**.

Your answer should be around ½ - 1 page long.

A company decides that there may be a market for a program that allows you to send SMS messages from a users' computer to a bluetooth attached mobile phone.

They investigate the market profile of various phones and their features before deciding that building the software is viable and financially feasible. They decide that they will only support 20 models of phone initially.

They then purchase each of the phones and examine their programming environment before settling on an overall architecture for the program.

The program is written over a period of 7 months after which they make it available for purchase from their website.

The response is moderate as a number of bugs cause customers not to purchase it after the free trial period. They decide that fixing those bugs will be worthwhile in terms of new purchases, which they do.

The next release also includes support for another 10 mobile phones.